Optics and Spectroscopy (English translation of Optika i Spektroskopiya) 1999 vol.87 N6, pages 851-858

Application of Rectangular Functions in Processing of Experimental Data on Luminescence Kinetics

Kazakov B., Mikheev A.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

Digital filters are developed that allow one, when processing experimental data on relaxation processes of the type exp(-Wt-γtν) and I1 exp(-t/τ1) + I2 exp(-t/τ2), to linearize the inverse problem of determining relaxation parameters, i.e., to independently estimate them by means of the linear least squares method. Operation of these filters is based on numerical integration of the experimental data with rectangular weight functions. The operation algorithms of the filters are simple and can be easily realized by computer simulation. Their efficiency is illustrated by analysis of kinetics of luminescence of Sm3+ ions in a TbF3 crystal and Cr3+ ions in a KZnF3 crystal.